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An Extinct Turtle of the Genus *Emys* from the Pleistocene of Kansas

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ABSTRACT: A species of Pleistocene turtle, *Emys twentei* sp. nov. is described from a locality 13 miles southwest of Meade, Meade county, Kansas. It is the only known fossil species of this genus (*sensu stricto*) in the Western Hemisphere.

THE summer expedition of the University of Kansas Museum of Vertebrate Paleontology in 1942, under the direction of Doctor Claude Hibbard, recovered from the Pleistocene high terrace deposits of Meade county, Kansas, the greater portion of the carapace of a fossil turtle. The discovery of the turtle, exposed at the surface, was made by Mr. Jack Twente, a member of the expedition. The species is named in his honor.

Doctor Hibbard revisited the locality and additional fragments of the same carapace were found scattered about. These he recovered and carefully fitted them together with the parts already taken.

The specimen, recently placed in my hands for study by Doctor Hibbard, proves to be an undescribed form of the genus *Emys*. This genus is represented in the Western Hemisphere by a single living species, *Emys blandingii* (Holbrook), that ranges through the Northern United States from Nebraska to New Jersey, and enters southern Canada. It has never been taken in Kansas, the nearest approach being Buffalo county, Nebraska. It has been reported in four counties* north of the Platte river in Nebraska.

* Reported from Cherry, Stanton, Thomas and Buffalo counties in Nebraska by George E. Hudson, The Amphibians and Reptiles of Nebraska, Nebraska Conservation Bulletin, No. 24, June, 1942, pp. 1-146, pls. 1-XX, maps 1-32.

Emys twentei sp. nov.

Holotype. University of Kansas Museum of Vertebrate Paleontology No. 6478; a turtle carapace, lacking the anterior end; collected by Doctor Claude W. Hibbard and party, summer of 1942.

Horizon and type locality. High terrace sands of Pleistocene Age on the north side of the Cimarron river, 13 miles southwest of Meade, Meade county, Kansas (Loc. No. 7, XI Ranch).

Diagnosis. A medium-sized turtle belonging to the genus *Emys*, related to *Emys blandingii*, but differing in having a carapace broader in proportion to its length, the bridge of the plastron wider and the extremely large vertebral plates much wider than the costal plates and wider than similar scales in *Emys blandingii*.

Description of type. Carapace relatively high, its elevation, 78 mm., equal to half its greatest width, 155 mm., and contained in its length (estimated at 220 mm.) 2.82 times. Presuming that the parts missing from the carapace, conform as well to the generic pattern as those parts do that are present, one may postulate the following complete scale and bone formulae:

Scutes: 1 nuchal, 5 vertebrales, 2 pygals, 4 costals, 11 marginals.

Bones: 1 nuchal, 8 neurals, 1 suprapygal, 1 pygal, 8 costals, 11 marginals.

There are ten ribs that contact the vertebrae, two each arising from the first and last costals; two vertebrae are attached to each of the neurals. The last neural is apparently a compound element composed of a second suprapygal and the eighth neural. The last vertebra, with a rib, is not attached to it.

The carapace, compared with a carapace of *Emys blandingii* of nearly equal length, presents the following differences. The distinct scars of the vertebral scutes show that these scales were considerably broader, while their length is nearly the same as in *E. blandingii*. The costal scutes on the other hand are of nearly the same size. The pygal scutes of the fossil have shorter marginal borders ($\frac{1}{6}$ less) and a somewhat deeper notch than these scales in *E. blandingii*; the neurals are wider for the most part but have approximately the same length. The exceptions are the seventh neural, which is considerably wider but shorter, and the eighth which is longer and wider, than the same scales in the living form.

The second costal has about the same transverse width, the third is decidedly wider, the fourth about the same as the corresponding scales in *E. blandingii*. The suprapygal is less widened, but about the same length.

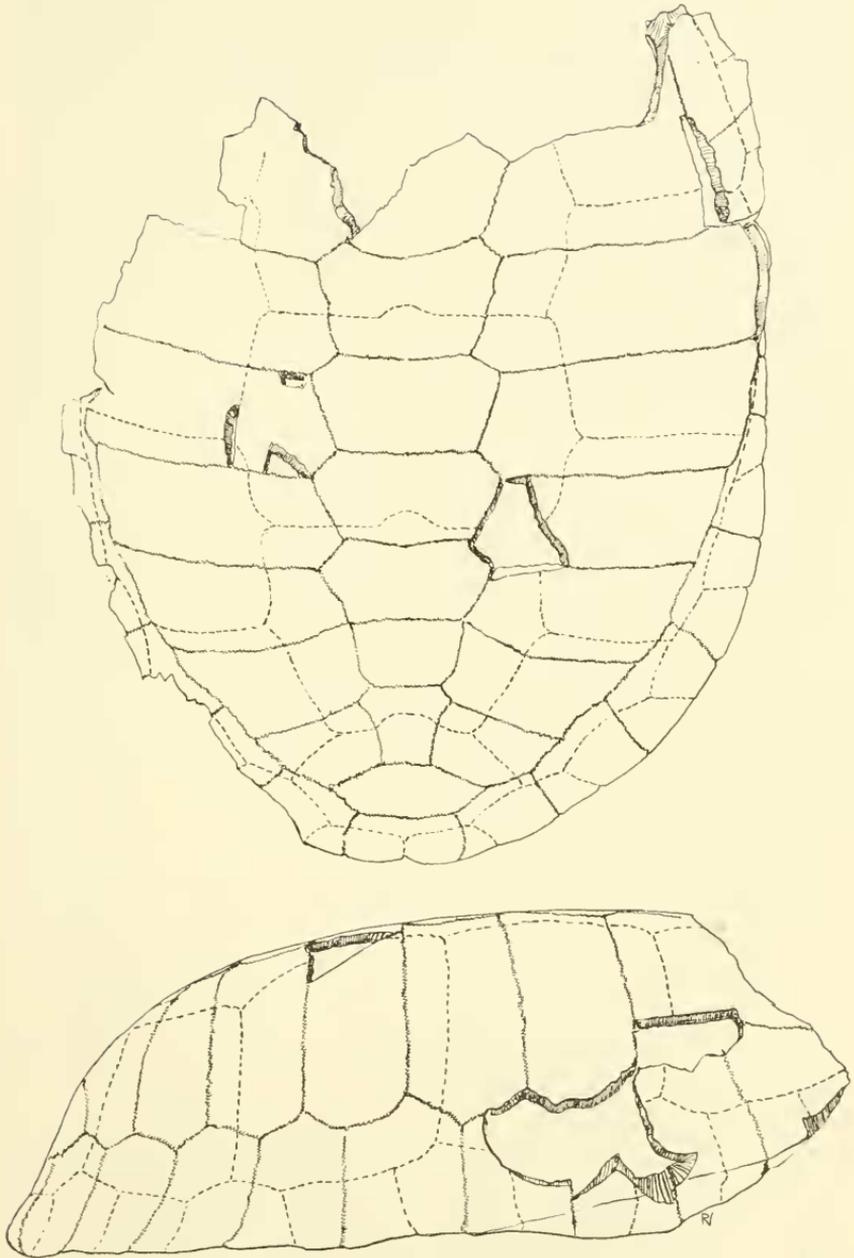


PLATE XX. *Emys twentii* sp. nov. From type, University of Kansas Museum of Vertebrate Paleontology, No. 6478, 13 miles southwest of Meade, Meade county, Kansas.

The free part of the fossil ribs are heavier than those in the living species, especially those arising from the eighth costals. The articulating surface for the ilium has a more pronounced elevation and a

wider surface. The scar on the inner lower edge of the carapace formed by the ligamentous attachment of the plastron is distinctly longer and the marginal bones are actually thicker in the fossil than in *blandingii*.

Measurements of type:

| | |
|---|-----------|
| Total length of carapace (estimated)..... | 220 |
| Total width..... | 155 |
| Greatest height | 78 |
| Third vertebral scute (length and width)..... | 45-72 |
| Fourth vertebral scute (length and width)..... | 51-61 |
| Fifth vertebral scute (length and width)..... | 48.5-47 |
| First costal* scute (length and width)..... | ? -52 |
| Second costal scute (length and width)..... | 49-59 |
| Third costal scute (length and width)..... | 50-58 |
| Fourth costal scute (length and width)..... | 42.2-47.7 |
| Pygals (marginal width combined)..... | 46.5 |
| Second neural plate, median (length and width)..... | ? -37 |
| Third neural plate, median (length and width)..... | 23-39 |
| Fourth neural plate, median (length and width)..... | 21-39 |
| Fifth neural plate, median (length and width)..... | 17-36 |
| Sixth neural plate, median (length and width)..... | 15-23 |
| Seventh neural plate, median (length and width)..... | 25-18 |
| Suprapygal neural plate, median (length and width)..... | 25-33.5 |
| Pygal neural plate, median (length and width)..... | 22.5-25 |
| Second costal (right side, width and length)..... | 64-25 |
| Third costal (right side, width and length)..... | 74-24 |
| Fourth costal (right side, width and length)..... | 73-25 |
| Fifth costal (right side, width and length)..... | 66-24 |
| Sixth costal (right side, width and length)..... | 59-23.5 |
| Seventh costal (right side, width and length)..... | 54-18 |
| Eighth costal (right side, width and length)..... | 38-19 |
| Total length of plastral attachment..... | 84 |

Remarks. The present distribution of *Emys* points to the fact that it is an ancient group and one that is marked for extinction. Its age is attested by the discoveries of fossil forms as early as the Oligocene.

The one living species known from the Western Hemisphere, *Emys blandingii* (Holbrook), has a range confined to the northern part of the United States, from Nebraska east to New Jersey, and north to southern Canada. Throughout much of its range it is regarded as rare.

In the Eastern Hemisphere there is a single living species, *Emys orbicularis* Linnaeus, with a distribution on three continents. In Europe it occurs in Spain, Italy, Saxony, Holland, Bulgaria (pygmy

* Measurement of costals are made on the curve. The "width" representing their long dimension.

form), Sweden, Eastern Russia, and Poland; in Asia it has been found in Astrakan, Caspian Sea Region, and Kurdistan; in Africa it is known in Algeria and Morocco. It is reputed to be disappearing from Europe, being known to have become extinct in Switzerland in historic time. Possibly one cause for its disappearance is the fact that it is widely used for food and is sold in various European markets. It is known in fossil form from Pleistocene deposits of Sweden, Denmark, Norfolk, Belgium, Germany, Switzerland, and Lombardy.

Several fossil forms of the genus have been described from Europe. *Emys turfa* H. v. Meyer, *Emys lutaria borealis* Nilsson have been referred to the living *Emys orbicularis* Linnaeus. Recently three fossil forms have been referred to this genus, which carry the history of the genus back to the Oligocene. These apparently are properly associated with the genus *Emys* as understood at the present time.

Szalai (1934) described *Emys strandi* from the Upper Oligocene of Hungary, and Bergounioux (1935) described *Emys grepiacensis* from the Oligocene of Toulouse, France, and *Emys aquitanensis* from the Mioocene of Sansan.

In North America, in the older literature, a large number of fossils have been referred to the genus *Emys*. However, subsequent studies of Cope, Hay and others have resulted in placing the forms so referred in other genera.* Not one has been left in the genus *Emys*.

DERMATEMYDIDAE

| | |
|----------------------------|-------------------------------------|
| <i>Emys obscurus</i> Leidy | = <i>Compsemys obscurus</i> (Leidy) |
| <i>Emys beatus</i> Leidy | = <i>Adocus beatus</i> (Leidy) |
| <i>Emys parva</i> Maaek } | = <i>Adocus parvus</i> (Leidy) |
| <i>Emys pravus</i> Leidy } | = <i>Agomphus turgidus</i> (Cope) |
| <i>Emys turgidus</i> Cope | = <i>Agomphus petrosus</i> (Cope) |
| <i>Emys petrosus</i> Cope | = <i>Agomphus firmus</i> (Leidy) |
| <i>Emys firmus</i> Leidy | = <i>Notomorpha gravis</i> (Cope) |
| <i>Emys gravis</i> Cope | |

EMYDIDAE

| | |
|--|--|
| <i>Emys latilabiatu</i> s Cope (part) } | = <i>Echmatemys lativertebralis</i> (Cope) |
| <i>Emys lativertebralis</i> Cope } | |
| <i>Emys stevensonianu</i> s Cope } | = <i>Echmatemys cibollensis</i> (Cope) |
| <i>Emys cibollensis</i> Cope } | |
| <i>Emys megaulax</i> Cope } | = <i>Echmatemys? megaulax</i> (Cope) |
| <i>Emys pachyomus</i> Cope } | = <i>Echmatemys testudinea</i> (Cope) |
| <i>Emys testudineu</i> s Cope } | = <i>Echmatemys euthincta</i> (Cope) |
| <i>Emys euthinctu</i> s Cope } | |
| <i>Emys wyomingensi</i> s Leidy (part) } | = <i>Echmatemys wyomingensis</i> (Leidy) |
| <i>Emys jeansi</i> Leidy } | |
| <i>Emys jcanesi</i> anus Leidy } | = <i>Echmatemys haydeni</i> (Leidy) |
| <i>Emys haydeni</i> Leidy } | |
| <i>Emys stevensonianu</i> s Leidy } | = <i>Echmatemys stevensonianus</i> (Leidy) |
| <i>Emys stvensoni</i> Leidy } | |
| <i>Emys septaria</i> Cope | = <i>Echmatemys septaria</i> (Cope) |
| <i>Emys Shaughnessiana</i> Cope | = <i>Echmatemys shaughnessiana</i> (Cope) |
| <i>Emys latilabiatu</i> s Cope | = <i>Echmatemys? latilabiata</i> (Cope) |
| <i>Emys polycephu</i> s (Cope) | = <i>Palaeotheca polycephala</i> Cope |
| <i>Emys terrestris</i> (Cope) | = <i>Palaeotheca terrestris</i> Cope |
| <i>Emys euglypha</i> Leidy | = <i>Trachemys euglypha</i> (Leidy) |
| <i>Emys petrolei</i> Leidy | = <i>Trachemys petrolei</i> (Leidy) |

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TESTUDINIDAE

| | | |
|--------------------------------|---|--------------------------------------|
| <i>Emys nebrascensis</i> Leidy | } | = <i>Stylemys nebrascensis</i> Leidy |
| <i>Emys lata</i> Leidy | | |
| <i>Emys hemispherica</i> Leidy | | |
| <i>Emys oweni</i> Leidy | | |
| <i>Emys culbertsoni</i> Leidy | | |
| <i>Emys carteri</i> Leidy | | = <i>Hadrianus corsoni</i> (Leidy) |